

WHAT IS CLAIMED IS:

1. A grinding head for a grinding machine for grinding a glass slab having an edge and threads comprising:

a) at least one supporting structure;

5 b) at least one first grinding wheel for grinding the edge of the slab, the first grinding wheel being supported and rotatably driven by a first spindle, the first grinding wheel and the first spindle being contained in and supported by the supporting structure;

10 c) at least one second grinding wheel for grinding the threads of the slab, the second grinding wheel being supported and rotatably driven by a second spindle, the second grinding wheel and the second spindle being contained in and supported by the supporting structure;

d) at least one third grinding wheel for polishing the edge of the slab, the third grinding wheel being supported and rotatably driven by a third spindle, the third grinding wheel and the third spindle being contained in and supported by the supporting structure; and

15 e) at least one fourth grinding wheel for polishing the threads of the slabs, the fourth grinding wheel being supported and rotatably driven by a fourth spindle, the fourth grinding wheel and the fourth spindle being contained in and supported by the supporting structure;

where the first and third grinding wheels for grinding and polishing the edges rotate, independently one from another, around an axis that is perpendicular to a rotation axis of the second and fourth grinding wheels for grinding and polishing the threads;

20 where the first, second, third and fourth grinding wheels for grinding and polishing the edge and grinding and polishing the threads are configured to perform, during operation, axial movements along the slabs; and

where the axial movements of the first, second, third and fourth grinding wheels are independently actuated one from another.

25 2. The grinding head of claim 1, comprising two first grinding wheels that are rotatably driven by two respective first spindles.

3. A grinding machine for grinding a glass slab comprising a grinding head according to claim 1, and further comprising a chassis for supporting the grinding head.

4. The grinding machine of claim 3, where the grinding head comprises four spindles that rotate around four respective axes, and configured to carry respective grinding wheels for grinding or polishing a section of the edge of the glass slab;

where the grinding machine comprises means for connecting the spindles to the chassis;

where the means for connecting comprises a supporting structure for the spindles and attaching and handling means carried by the supporting structure for coupling the supporting structure to the chassis in a movable way at least in a first advancement direction and configured to be motored in order to displace, during operation, the supporting structure with respect to the chassis along the section to be ground in first advancement direction.

5. The grinding machine of claim 4, where the attaching and handling means comprises a slide configured to cooperate with a guide carried by the chassis.

6. The grinding machine of claim 5, where the attaching and handling means comprises a fifth wheel interposed between the supporting structure and the slide to allow a rotation of the supporting structure with respect to the slide around a hinge axis.

7. The grinding machine of claim 6, where the fifth wheel axis is orthogonal to the first advancement direction.

8. The grinding machine of claim 4, where at least one of the four axes is parallel to at least one other of the four axes.

9. The grinding machine of claim 4, where at least one of the four axes is not parallel to at least one other of the four axes.

10. The grinding machine of claim 4, further comprising a motor for each spindle for rotating the grinding wheel related to each spindle.

11. The grinding machine of claim 4, further comprising a motor for each spindle for axially advancing the grinding wheel related to each spindle.

12. The grinding machine of claim 4, where the axes are orthogonal to a rectilinear direction that is parallel, during operation, to the section to be ground, an encumbrance occupied by the grinding wheels, measured along a rectilinear direction, being included between 25 and 35 centimeters.

5 13. The grinding machine of claim 10, where at least part of the motors have respective elongated structures in orthogonal directions to a rectilinear direction.

10 14. The grinding machine of claim 4, where the grinding head comprises two first spindles that are able to rotate around respective mutually parallel first axes lying in a plane, and two second spindles that form respective angles that are mutually equal and opposite with the plane.

15 15. The grinding machine of claim 4, where the supporting structure is fork-shaped.

16. The grinding head of claim 1, where the supporting structure is further equipped with means for supporting the glass slab, and where the means for supporting comprises a plurality of wheels to facilitate moving the slab.

15 17. The grinding head of claim 1, where the grinding wheel for grinding and polishing the threads and the grinding wheel for polishing the edge are driven by their respective spindles to create constant pressure by the grinding wheels on the glass slab during operation and to compensate for the consumption of the grinding wheels during their operation.

20 18. The grinding head of claim 17, where the spindles each comprise resilient means pre-loaded by a stepped motor that drives a ball screw for realizing the constant pressure on the glass slab during operation.

25 19. The grinding head of claim 17, where each of the spindles further comprises braking means that operates on sliding guides and block an advancement of the grinding wheels against the glass slabs between one slab and a following slab, to prevent the grinding wheels from penetrating into a hollow space between the two successive glass slabs during operation.

20. A method of grinding the edges of a glass slab that reduces or eliminates positioning and squaring errors of semi-finished glass slabs with respect to grinding wheels while the semi-finished glass slabs are moved on a conveyor, comprising:

- a) providing a grinding machine according to claim 3; and
- b) grinding the edges of the glass slab using the grinding machine.

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